

# LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

## Volume 5 | Technical Appendices

CFA16 | Ladbroke and Southam

**Construction assessment (SV-003-016)**

Sound, noise and vibration

November 2013

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Department  
for Transport

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# Appendix SV-003-016

|                       |                            |     |
|-----------------------|----------------------------|-----|
| Environmental topic:  | Sound, noise and vibration | SV  |
| Appendix name:        | Construction assessment    | 003 |
| Community forum area: | Ladbroke and Southam       | 016 |

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# 1 Introduction

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant route-wide methodology, assumptions and assessment (Volume 5: Appendix SV-100-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the Ladbroke and Southam Community Forum Area (CFA16), the other three sections are as follows:
- baseline sound, noise and vibration (Appendix SV-002-016);
  - construction sound, noise and vibration (Appendix SV-003-016) (this appendix); and
  - operational sound, noise and vibration (Appendix SV-004-016).
- 1.1.3 The outcomes of the assessment are summarised in Volume 2: CFA16 Report, Chapter 11 Sound, Noise and Vibration
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 map book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the construction of the Proposed Scheme for the Ladbroke and Southam area on:
- people, primarily where they live ('residential receptors') in terms a) individual dwellings and b) on a wider community basis, including any shared community open areas; and
  - community facilities such as schools, hospitals, places of worship and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from construction noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- |                                   |                     |
|-----------------------------------|---------------------|
| • Agriculture, forestry and soils | Appendix AG-001-016 |
| • Community                       | Appendix CM-001-016 |
| • Ecology                         | Appendix EC-005-016 |
| • Heritage                        | Appendix CH-003-016 |
| • Landscape and Visual            | Appendix LV-001-016 |

## 1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the

impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.

- 1.2.2 Indirect effects arising from temporary changes in traffic patterns on the existing road network as a consequence of constructing the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5: Appendix SV-001-000.
- 1.2.3 In undertaking the assessment of sound and vibration, consistent with Environmental Impact Assessment (EIA) Regulations and emerging National Planning Practice Guidance<sup>1</sup>, a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.
- 1.2.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The Assessment Locations employed in this assessment are presented on map series Sv-03 in the CFA16 Volume 5 sound, noise and vibration map book.

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<sup>1</sup> Information is provided in the emerging National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk>, refer to the noise exposure hierarchy.

## 2 Scope, assumptions and limitations

### 2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group – Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group – Acoustics, the following local policy guidance on noise and vibration has been identified:

- The Stratford-on-Avon District Local Plan Review – July 2006.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

### 2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group – Acoustics, is set out in Volume 1.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration;
- September/October 2012; a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November/December 2012; specific request for the Community Forum to propose baseline sound monitoring locations;
- January/February 2013; feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal/written response to questions and sound, noise and vibration.

### 2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), is clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.



## 2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1 and are further detailed in Appendix SV-001-000. Local assumptions that apply to the assessment of construction sound noise and vibration within this CFA are set out in Volume 2: Report 16.
- 2.4.2 Tunnel Boring Machines (TBMs) will be used to excavate the tunnels. Materials (including tunnel lining segments), people and equipment will be transported from the surface to each TBM using small construction trains, which will travel at relatively low speeds. Excavated material from each TBM will be transported to the surface by conveyor. It has been assumed that significant noise and vibration effects arising from use of the temporary railway will be avoided through appropriate design and maintenance specification. Other methods material movement may be employed; however, these would result in lower ground-borne noise and vibration.

## 2.5 Limitations

- 2.5.1 The route-wide limitations and the approach adopted to assure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000. In this area, there are a number of locations where the land or property owners did not permit baseline monitoring to be undertaken at their premises. However, sufficient information has been obtained to support the construction assessment. Further information is provided in Volume 5: Appendix SV-002-016.

## 3 Environmental baseline

### 3.1 Existing baseline

- 3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are given in Volume 5: Appendix SV-002-016. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-016.

### 3.2 Future baseline

- 3.2.1 The assessment of noise from construction activities assumes a baseline year of 2017, which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017. The assessment of noise from construction traffic assumes a baseline year of 2021, representative of the middle of the construction period when the construction traffic flows are expected to be at their peak. Further information can be found in the Traffic and Transport assessment (Appendix TT-001-016).

## 4 Effects arising during construction

### 4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is:

- avoidance and mitigation measures;
- quantitative identification of impact and effects:
  - ground-borne sound and vibration:
    - residential; and
    - non-residential.
  - airborne sound:
    - residential; and
    - non-residential.
- assessment of impacts and effects:
  - residential receptors: direct effects – dwellings;
  - residential receptors: direct effects – communities;
  - residential receptors: indirect effects;
  - non-residential receptors: direct effects;
  - non-residential receptors: indirect effects; and
  - cumulative effects from the proposed scheme and other committed development.

### 4.2 Avoidance and mitigation measures

4.2.1 These are set out in Volume 2: Report 16.

### 4.3 Quantitative identification of impacts and effects

#### Ground-borne sound and vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on map series SV-02 in the CFA16 Volume 5 sound, noise and vibration map book.

4.3.2 For each Assessment Location, the assessment results for residential and non-residential receptors are presented in Table 1. Explanation of the information in

Table 1 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

|    |   |
|----|---|
|    | Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual receptor.  |
| *  | Significant effect – the quantitative impact methodology has identified either: <ol style="list-style-type: none"> <li>1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or</li> <li>2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect</li> </ol> |
| ~  | Significant effect – the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)   |
| A  | Type of effect – adverse effect   |
| S  | Type of effect – significant adverse effect   |
| NA | Type of effect – not generally an adverse effect  |
| B  | Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000  |
| V1 | Type of receptor – (V1) vibration sensitive research and manufacturing, hospital, and university equipment, (V2) hotels, hospital wards and education dormitories, (V3) offices, schools and places of worship, (V4) workshops  |
| T  | Receptor design – typical   |
| S  | Receptor design – special   |

## Appendix SV-003-016 | Effects arising during construction

Table 1: Assessment of construction induced ground-borne sound and vibration at residential receptors

| Assessment location |                       | Impact criteria                                   |  |   | Significance criteria  |                |                               |                  |                 |                      |                |                 |                          |                   | Significant effect |
|---------------------|-----------------------|---|--|---|--|----------------|-------------------------------|------------------|-----------------|----------------------|----------------|-----------------|--------------------------|-------------------|--------------------|
| ID                  | Area represented      | Peak particle velocity (PPV) [mm/s] on foundation | Typical/highest monthly indoor vibration dose value (VDV) [m/s <sup>1.75</sup> ] |   | Construction activity resulting in highest forecast vibration levels | Type of effect | Number of impacts represented | Type of receptor | Receptor design | Existing environment | Unique feature | Combined impact | Impact duration [months] | Mitigation effect |                    |
| 231410              | Stoneythorpe, Southam | 0.18  | 0.09/0.09  | - | Earthworks   | NA             | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 238281              | Banbury Road, Southam | 0.42  | 0.1/0.1  | - | Earthworks   | NA             | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 239943              | Banbury Road, Southam | 0.27  | 0.13/0.13  | - | Earthworks   | NA             | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 240636              | Station Road, Southam | 0.61  | 0.27/0.27  | - | Earthworks   | A              | 1                             | R                | T               | -                    | -              | -               | 5                        | -                 | ~                  |
| 240670              | Kineton Road, Southam | 0.15  | 0.08/0.08  | - | Earthworks   | NA             | 2                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 240744              | Stoneythorpe, Southam | 0.28  | 0.14/0.14  | - | Earthworks   | NA             | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |

Table 2: Assessment of construction induced ground-borne vibration at non-residential receptors

| Assessment location |                       | Impact criteria          |  |                 |  | Significance criteria |                               |                  |                 |                      |                |                 |                          |                   | Significant effect |
|---------------------|-----------------------|--------------------------|--|-----------------|--|-----------------------|-------------------------------|------------------|-----------------|----------------------|----------------|-----------------|--------------------------|-------------------|--------------------|
| ID                  | Area represented      | PPV [mm/s] on foundation | Typical/highest monthly indoor vibration dose value (VDV) [m/s <sup>1.75</sup> ] |                 | Construction activity resulting in highest forecast vibration levels | Type of effect        | Number of impacts represented | Type of receptor | Receptor design | Existing environment | Unique feature | Combined impact | Impact duration [months] | Mitigation effect |                    |
|                     |                       |                          | Day 0700-2300  | Night 2300-0700 |  |                       |                               |                  |                 |                      |                |                 |                          |                   |                    |
| 231410              | Stoneythorpe, Southam | 0.18                     | 0.09/0.09  | -               | Earthworks   | B                     | 1                             | G5               | T               | -                    | -              | -               | 13                       | -                 | -                  |
| 241232              | Kineton Road, Southam | 0.31                     | 0.15/0.15  | -               | Earthworks   | B                     | 29                            | V3               | T               | -                    | -              | -               | 1                        | -                 | -                  |

## Airborne sound: direct impacts and effects

- 4.3.3 Activities associated with the construction phases of the Proposed Scheme would generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:
- residential receptors, both as individual dwellings and communities; and
  - non-residential receptors, including quiet areas.
- 4.3.4 For each type of receptor, subject to the screening distances identified and based upon supplied plant information from engineers, the typical and highest monthly  $L_{Aeq,T}$  noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.
- 4.3.5 Construction noise predictions have been based on the best information available at the time of the assessment supplied by the engineers. Changes to the Proposed Scheme subsequent to the assessment may result in changes in the number and locations of identified effects. Where changes to the design have been identified, a qualitative assessment of the impacts has been undertaken.
- 4.3.6 Information regarding the number and use of all receptors has been based upon supplied information and area surveys. A worst case approach has been taken and wherever possible and the most sensitive likely receptor has been assumed.
- 4.3.7 The assessment results, impact criteria and significance criteria for the assessment of the scheme at residential and non-residential receptors are presented in Table 3 and Table 4 respectively.
- 4.3.8 Explanation of the information within Table 3 and Table 4 is provided in Appendix SV-001-000, with the following additional notes:

|    |  |
|----|--|
|    | Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual non-residential receptor  |
| *  | Significant effect – the quantitative impact methodology has identified either:<br>1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or<br>2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect |
| ~  | Significant effect – the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)  |
| A  | Type of effect – adverse effect  |
| S  | Type of effect – significant adverse effect  |
| NA | Type of effect – not generally an adverse effect   |
| B  | Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000   |
| R  | Type of receptor – residential   |
| G  | Type of receptor – (G1) theatres, large auditoria and concert halls, (G2) sound recording and broadcast studios, (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) schools, colleges, hospitals, hotels and libraries, and (G5) offices and general commercial premises  |
| T  | Receptor design – typical  |
| S  | Receptor design – special  |
| H  | Existing environment – high existing ambient noise levels, day >75 dB, evening >65 dB or night >55 dB $L_{pAeq}$ at the façade   |
| L  | Existing environment – low existing ambient noise levels, day ≤45 dB, evening ≤45 dB or night ≤35 dB $L_{pAeq}$ at the façade  |
| NI | Mitigation effect – identified as likely to qualify for noise insulation under the draft CoCP  |

Table 3: Assessment of construction noise at residential receptors

| Assessment location |                                | Impact criteria  |                          |                        |  | Significance criteria |                               |                  |                 |                      |                |                 |                          |                   |   | Significant effect |
|---------------------|--------------------------------|--|--------------------------|------------------------|--|-----------------------|-------------------------------|------------------|-----------------|----------------------|----------------|-----------------|--------------------------|-------------------|---|--------------------|
| ID                  | Area represented               | Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the facade [Assessment category A/B/C] |                          |                        | Construction activity resulting in highest forecast noise levels | Type of effect        | Number of impacts represented | Type of receptor | Receptor design | Existing environment | Unique feature | Combined impact | Impact duration [months] | Mitigation effect |   |                    |
|                     |                                | Day<br>0700-<br>1900   | Evening<br>1900-<br>2300 | Night<br>2300-<br>0700 |  |                       |                               |                  |                 |                      |                |                 |                          |                   |   |                    |
| 231410              | Leamington Road, Southam       | 65/66 [A]  | -                        | -                      | Road construction  | A                     | 1                             | R                | T               | -                    | -              | -               | 18                       | -                 | ~ |                    |
| 232805              | Welsh Road, Bascote            | 56/57 [C]  | -                        | -                      | Earthworks   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 232831              | Ufton Hill, Ufton              | 56/63 [A]  | -                        | -                      | Earthworks   | NA                    | 2                             | R                | T               | L                    | -              | -               | -                        | -                 |   |                    |
| 232863              | Welsh Road West, Bascote       | 52/59 [A]  | -                        | -                      | Porous portal works  | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 233039              | Welsh Road, Bascote            | 52/55 [A]  | -                        | -                      | Viaduct superstructure   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 233194              | Stoneythorpe, Southam          | 59/65 [A]  | -                        | -                      | Road construction  | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 233308              | Featherbed Lane, Bascote Heath | 46/50 [A]  | -                        | -                      | Road construction  | NA                    | 12                            | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 236543              | Wormleighton, Southam          | 47/50 [A]  | -                        | -                      | PRoW superstructure  | NA                    | 8                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 236568              | Wormleighton, Southam          | 47/50 [A]  | -                        | -                      | PRoW superstructure  | NA                    | 7                             | R                | T               | -                    | -              | -               |                          | -                 |   |                    |
| 236676              | Wormleighton, Southam          | 44/47 [A]  | -                        | -                      | Earthworks   | NA                    | 2                             | R                | T               | -                    | -              | -               |                          | -                 |   |                    |
| 236736              | Wormleighton, Southam          | 46/51 [B]  | -                        | -                      | Earthworks   | NA                    | 10                            | R                | T               | -                    | -              | -               |                          | -                 |   |                    |
| 238088              | Banbury Road, Southam          | 53/56 [A]  | -                        | -                      | Demolition works   | NA                    | 3                             | R                | T               | L                    | -              | -               | -                        | -                 |   |                    |
| 238281              | Banbury Road, Southam          | 64/69 [A]  | -                        | -                      | Earthworks   | A                     | 1                             | R                | T               | -                    | -              | -               | 19                       | -                 | ~ |                    |
| 238331              | Banbury Road, Southam          | 62/66 [C]  | -                        | -                      | Balancing pond Earthworks  | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |
| 238957              | Ladbroke, Southam              | 56/60 [A]  | -                        | -                      | Road construction  | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |   |                    |



| Assessment location |                                  | Impact criteria  |                      |                    |  | Significance criteria |                               |                  |                 |                      |                |                 |                          |                   | Significant effect |
|---------------------|----------------------------------|--|----------------------|--------------------|--|-----------------------|-------------------------------|------------------|-----------------|----------------------|----------------|-----------------|--------------------------|-------------------|--------------------|
| ID                  | Area represented                 | Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the facade [Assessment category A/B/C] |                      |                    | Construction activity resulting in highest forecast noise levels | Type of effect        | Number of impacts represented | Type of receptor | Receptor design | Existing environment | Unique feature | Combined impact | Impact duration [months] | Mitigation effect |                    |
|                     |                                  | Day<br>0700-1900   | Evening<br>1900-2300 | Night<br>2300-0700 |  |                       |                               |                  |                 |                      |                |                 |                          |                   |                    |
| 239026              | Lower Radbourne, Southam         | 61/67 [A]  | -                    | -                  | Earthworks   | A                     | 1                             | R                | T               | -                    | -              | -               | 3                        | -                 | ~                  |
| 239286              | Windmill Lane, Ladbroke, Southam | 56/62 [A]  | -                    | -                  | Earthworks   | NA                    | 2                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 239943              | Banbury Road, Southam            | 65/70 [B]  | -                    | -                  | Earthworks   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 240604              | Kineton Road, Southam            | 50/59 [A]  | -                    | -                  | Road construction  | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 240636              | Kineton Road, Southam            | 69/74 [C]  | -                    | -                  | Earthworks   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 240670              | Kineton Road, Southam            | 58/66 [A]  | -                    | -                  | Earthworks   | A                     | 2                             | R                | T               | -                    | -              | -               | 1                        | -                 | ~                  |
| 240744              | Leamington Road, Southam         | 64/70 [A]  | -                    | -                  | Retaining wall construction                                      | A                     | 1                             | R                | T               | -                    | -              | -               | 15                       | -                 | ~                  |
| 240780              | Leamington Road, Southam         | 55/63 [A]  | -                    | -                  | Earthworks   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 240879              | Stoneythorpe Hall, Welsh Road    | 50/55 [A]  | -                    | -                  | Earthworks   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 241272              | Banbury Road, Southam            | 59/63 [A]  | -                    | -                  | Earthworks   | NA                    | 4                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 253196              | Lower Boddington, Daventry       | 47/51 [A]  | -                    | -                  | Bridge superstructure  | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |
| 253215              | Lower Boddington, Daventry       | 61/66 [A]  | -                    | -                  | Earthworks   | A                     | 1                             | R                | T               | -                    | -              | -               | 5                        | -                 | ~                  |
| 253243              | Lower Boddington, Daventry       | 60/66 [A]  | -                    | -                  | Road construction  | A                     | 1                             | R                | T               | -                    | -              | -               | 4                        | -                 | ~                  |
| 700442              | Wormleighton, Southam            | 43/48 [A]  | -                    | -                  | Earthworks   | NA                    | 1                             | R                | T               | L                    | -              | -               | -                        | -                 |                    |
| 700654              | Leamington Road, Southam         | 58/64 [A]  | -                    | -                  | Earthworks   | NA                    | 1                             | R                | T               | -                    | -              | -               | -                        | -                 |                    |

Table 4: Assessment of construction noise at non-residential receptors

| Assessment location |  | Impact criteria   |                            |                 |  | Significance criteria |                               |                  |                 |                      |                |                 |                          |                   | Significant effect |
|---------------------|--|---|----------------------------|-----------------|--|-----------------------|-------------------------------|------------------|-----------------|----------------------|----------------|-----------------|--------------------------|-------------------|--------------------|
| ID                  | Area represented                                     | Typical/highest monthly outdoor $L_{pAeq}$ [dB] at the facade |                            |                 | Construction activity resulting in highest forecast noise levels | Type of effect        | Number of impacts represented | Type of receptor | Receptor design | Existing environment | Unique feature | Combined impact | Impact duration [months] | Mitigation effect |                    |
|                     |  | Day 0700-1900   | Evening 1900-2300/ Weekend | Night 2300-0700 |  |                       |                               |                  |                 |                      |                |                 |                          |                   |                    |
| 231410              | Codemasters, Leamington Road, Southam                | 65/66   | -                          | -               | Road construction  | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 232831              | General Commercial, Ufton Hill                       | 56/63   | -                          | -               | Earthworks   | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 233194              | Dallas Burston Polo Ground, Leamington Road, Southam | 59/65   | -                          | -               | Road construction  | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 233308              | General Commercial, Bascote Heath                    | 46/50   | -                          | -               | Road construction  | B                     | 2                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 236543              | Saint Peters church, Wormleighton                    | 47/50   | -                          | -               | PRoW superstructure  | B                     | 1                             | G3               | T               | -                    | -              | -               | -                        | -                 |                    |
| 236568              | General Commercial, Wormleighton                     | 47/50   | -                          | -               | PRoW superstructure  | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 236813              | Wormleighton village hall                            | 43/47   | -                          | -               | Earthworks   | B                     | 1                             | G3               | T               | -                    | -              | -               | -                        | -                 |                    |
| 237620              | General Commercial, Ladbroke                         | 44/48   | -                          | -               | Earthworks   | B                     | 2                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 237878              | Engineering Works, School Lane                       | 43/46   | -                          | -               | Earthworks   | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 238088              | General Commercial, Banbury Road                     | 53/56   | -                          | -               | Demolition works   | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 238174              | General Commercial, Ladbroke                         | 49/53   | -                          | -               | Earthworks   | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 240161              | General Commercial, Northfield Road                  | 52/60   | -                          | -               | Earthworks   | B                     | 12                            | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 240604              | Office, Kineton Road                                 | 50/59   | -                          | -               | Road construction  | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |

## Appendix SV-003-016 | Effects arising during construction

| Assessment location |   | Impact criteria  |                                  |                    |  | Significance criteria |                               |                  |                 |                      |                |                 |                          |                   | Significant effect |
|---------------------|---|--|----------------------------------|--------------------|--|-----------------------|-------------------------------|------------------|-----------------|----------------------|----------------|-----------------|--------------------------|-------------------|--------------------|
| ID                  | Area represented  | Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the facade |                                  |                    | Construction activity resulting in highest forecast noise levels | Type of effect        | Number of impacts represented | Type of receptor | Receptor design | Existing environment | Unique feature | Combined impact | Impact duration [months] | Mitigation effect |                    |
|                     |   | Day<br>0700-1900   | Evening<br>1900-2300/<br>Weekend | Night<br>2300-0700 |  |                       |                               |                  |                 |                      |                |                 |                          |                   |                    |
| 240829              | General Commercial, Welsh Road West                         | 50/54  | -                                | -                  | Earthworks   | B                     | 3                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 241232              | General Commercial, Kineton Road Industrial Estate, Southam | 62/74  | -                                | -                  | Road construction  | B                     | 29                            | G5               | T               | -                    | -              | -               | 2                        | -                 | *                  |
| 241411              | General Commercial, Westfield Road                          | 49/55  | -                                | -                  | Road construction  | B                     | 32                            | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 242240              | Abbey, Elm Close  | 43/46  | -                                | -                  | Earthworks   | B                     | 1                             | G3               | T               | -                    | -              | -               | -                        | -                 |                    |
| 244191              | General Commercial, Warwick Road                            | 43/46  | -                                | -                  | Road construction  | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 244689              | Military Youth Club, Wattons Lane                           | 50/55  | -                                | -                  | Retaining wall construction                                      | B                     | 1                             | G3               | T               | -                    | -              | -               | -                        | -                 |                    |
| 248022              | Office, Welsh Road East                                     | 47/51  | -                                | -                  | Earthworks   | B                     | 1                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 700625              | Shopping, Northfield Road                                   | 45/50  | -                                | -                  | Road construction  | B                     | 6                             | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 700634              | General Commercial, Banbury Road                            | 55/61  | -                                | -                  | Road construction  | B                     | 14                            | G5               | T               | -                    | -              | -               | -                        | -                 |                    |
| 700635              | Office, Banbury Road  | 46/47  | -                                | -                  | Road construction  | B                     | 1                             | G5               | T               | -                    | -              | -               |                          | -                 |                    |

## Airborne sound: indirect effects

- 4.3.9 Construction road traffic associated with the construction phases of the Proposed Scheme would generate airborne noise. Based upon supplied traffic information [Ref ES doc which contains this info] from engineers, the change in noise levels for a given road as a result of the presence of construction traffic at a reference distance of 10m from the edge of nearside carriageway has been predicted. The results are presented in Table 5.
- 4.3.10 Explanation of the information within Table 5 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

Where the significant effect column is highlighted, then a significant effect is identified on nearby communities or individual receptors

### Change values

- Yellow denotes a minor impact – a change is of 3-5 dB or 1-3dB where a high existing sound level is identified  
 Orange denotes a moderate impact – a change is of 5-10 dB or 3-5dB where a high existing sound level is identified  
 Red denotes a major impact – a change is of >10 dB or >5dB where a high existing sound level is identified

Table 5: Assessment of construction traffic noise levels

| Road name                         | Link   | Future baseline sound level (dB)                              | Future baseline sound level + construction traffic (dB)      | Change (dB) | Significant effect |
|-----------------------------------|--|---|--|-------------|--------------------|
|                                   |  | Daytime<br>L <sub>pAeq,16hr</sub><br>0700-23:00<br>free-field | Daytime<br>L <sub>pAeq,16hr</sub><br>0700-2300<br>free-field |             |                    |
| Glebe Farm access road            | A423 Banbury Road to Lower Radbourne main compound       | 46.3  | 53.5   | +7.2        |                    |
| A423 Banbury Road                 | A425 Leamington Road to Wormleighton                     | 68.5  | 69.4   | +0.9        |                    |
| A423 Banbury Road                 | A425 Leamington Road to A425 Daventry Road               | 69.2  | 69.3   | +0.1        |                    |
| A425 Leamington Road              | B4451 Kineton Road to A423 Banbury Road                  | 70.0  | 70.5   | +0.5        |                    |
| B4451 Kineton Road                | A425 Leamington Road to Kineton Road overbridge compound | 66.8  | 66.9   | +0.1        |                    |
| A425 Leamington Road              | B4451 Kineton Road to the B4452                          | 69.9  | 70.2   | +0.3        |                    |
| A425 Leamington Road/Southam Road | B4452 to B4455 Fosse Way                                 | 69.4  | 70.2   | +0.8        |                    |

## 4.4 Assessment of significant effects

### Residential receptors: direct effects – individual dwellings

- 4.4.1 Taking account of the avoidance and mitigation measures set out in Volume 2: Report 16, no residential buildings are forecast to experience noise levels higher than the

noise insulation trigger levels as defined in the draft CoCP. For daytime construction, the trigger level is an equivalent continuous noise level of 75dB<sup>2</sup>, measured outdoors.

- 4.4.2 The mitigation measures will reduce noise inside all dwellings, such that it does not reach a level where it would significantly affect residents<sup>3</sup>.

### **Residential receptors: direct effects – communities**

#### *Surface sections*

- 4.4.3 The avoidance and mitigation measures in this area will avoid airborne construction noise adverse effects on the majority of receptors and communities. Residual temporary noise or vibration effects are identified later in this section.
- 4.4.4 It is anticipated that there may be some night-time working during road and rail possession periods. Night-time construction activities in this area would be restricted to where the route crosses existing railway lines, roads or where newly constructed roads tie into the existing road network for reasons of safety, engineering practicability or to reduce the impact on existing transport. These works are likely to be of short duration, and be limited in the types of activities being undertaken. As a consequence, it is expected that the noise effects from night time activities would be limited in duration and hence would not be considered significant
- 4.4.5 With regard to noise outside dwellings, the assessment of temporary effects takes account of construction noise relative to existing sound levels.
- 4.4.6 In locations with lower existing sound levels, construction noise effects are likely to be caused by changes to noise levels outside dwellings. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life. These effects are considered to be significant when assessed on a community basis taking account of the local context.
- 4.4.7 In this area, the mitigation measures reduce the effects of outdoor construction noise on the acoustic character around the local residential communities such that the effects are considered to be not significant.

#### *Tunnelled sections*

- 4.4.8 A tunnel boring machine (TBM) will be used to excavate the tunnel under Long Itchington Wood. Each TBM is likely to generate ground-borne noise and vibration impacts but only at receptors within a close distance of the centre line of the tunnels and only for short periods of time. Overall, the deeper the tunnel is, the lower the impact. The perceptible noise and vibration will increase as each TBM approaches and diminish as it moves away from the receptor. Vibration from TBMs will present no risk of any building damage.
- 4.4.9 The effects of vibration from TBMs on building occupants will be short term and hence they are not considered to be significant. Proactive and advanced community relations in advance of the TBM passing under properties will help manage expectations and allay possible concerns over the short term presence of vibration

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<sup>2</sup> L<sub>pAeq,0800-1800</sub> measured at the facade.

<sup>3</sup> Further information is provided in Volume 5: Appendix SV-001-000.

### Residential receptors: indirect effects

- 4.4.10 Due to construction traffic a moderate impact is predicted along the Glebe Farm access road. Taking account of incorporated mitigation, the limited number of properties adjacent to these roads and the predicted change in traffic noise levels; no indirect construction noise significant effects have been identified.
- 4.4.11 In certain instances a qualitative assessment has been undertaken. This was the case for assessment of noise due to construction traffic along A425 Daventry Road and Welsh Road East, in the vicinity of Southam. Construction traffic accesses Welsh Road East via the A423 Banbury to the east of Southam and the A425 Daventry Road, vehicle numbers are assumed to be similar to those along the A423 Banbury Road, south of Southam and hence no significant temporary effect is considered likely as a result of their use.

### Non-residential receptors: direct effects

- 4.4.12 Significant construction noise or vibration effects on non-residential receptors are unlikely to occur in this area.
- 4.4.13 An exceedance of the daytime impact criteria has been identified at southern edge of the Kineton Road Industrial Estate, represented by assessment locations 241232. In the vicinity of the construction works there are a number warehouse and industrial units incorporating component and automotive manufactures, food manufacturers and office accommodation. Noise levels, at the building facade closest to the construction activities, exceed the daytime criteria by 1dB for a total of two months commencing in 2018, due to ground engineering works associated with the Kineton Road realignment and utility diversions. Due to the incident noise levels from the identified construction activities, their limited duration, and the sensitivity of the adjacent receptors, a significant daytime effect is not identified at this receptor.

### Non-residential receptors: indirect effects

- 4.4.14 Significant noise effects on non-residential receptors arising from construction traffic are unlikely to occur in this area.

### Cumulative effects from the Proposed Scheme and other committed development

- 4.4.15 This assessment has considered the potential cumulative construction noise effects of the proposed scheme and other committed developments<sup>4</sup>. In this area, there is no development that would be built at the same time as the Proposed Scheme and accordingly, construction noise or vibration from the Proposed Scheme is unlikely to result in any significant cumulative noise effects.

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<sup>4</sup> Refer to Volume 5: Appendix CT-004-000.

## 5 References

*Control of Pollution Act 1974* (c. 40), London, Her Majesty's Stationery Office.

*Environmental Protection Act 1990*. London, Her Majesty's Stationery Office.